

# EB Series

## Water Boilers

### Forced Draft - Gas, Oil, Gas/Oil

The boiler shall be a Bryan Model \_\_\_\_\_ flexible water tube water boiler, with a capacity of \_\_\_\_\_ BTU input and \_\_\_\_\_ BTU output. (\_\_\_\_\_ HP)

The boiler shall be constructed and assembled as a completely packaged unit ready for field connections to the water supply, return connection, electrical power supply, fuel supply(s), relief valve discharge, building management controls and flue-gas vent.

The water boiler shall be manufactured in strict accordance with ASME Heating Boiler Code, Section IV, and shall bear the ASME "H" stamp for maximum working pressure of 160 PSIG and 250° F temperature.

The boiler shall also be built to withstand 150 degree delta "T".

*(Also available for higher pressures up to 250 PSIG and temperatures to 300°F per ASME Section I)*

#### **VESSEL AND TUBE CONSTRUCTION**

The boiler shall be constructed on a heavy steel frame. The boiler pressure vessel shall be provided with adequately sized upper and lower drums. A minimum of two downcomers shall be provided and shall be located inside furnace chamber to maximize proper thermal internal water circulation. No external water circulation source shall be required. Steel water tubes are to be 1½" O.D., .095 wall thickness, six-pass, flexible serpentine bend design, not subject to thermal shock damage. Individual water tubes shall be easily removable and replaceable without either welding or rolling. The boiler shall have no more than two tube configurations. The boiler shall be furnished with an adequate number of tappings and inspection openings to facilitate internal boiler inspection and cleaning.

#### **FURNACE/COMBUSTION CHAMBER CONSTRUCTION**

Access to the furnace/combustion chamber is gained by a hinged access door(s) with an opening of no less than 26" wide x 62" high maximum to allow for inspection of the interior chamber and the burner head. All remaining

panels shall be individually removable. All access panels shall be affixed to the pressure vessel frame and insulated with 2" mineral fiber mono block and 2" high temperature ceramic blanket insulation and be fully gasketed for pressurized firing.

The furnace/combustion chamber shall be primarily of water-wall design with one side of removable panels. The stationary interior wall shall be lined with 1" mineral fiber mono block and 1" ceramic blanket insulation. The front and rear walls are insulated with 4" mineral fiber mono block and 2" ceramic blanket. The floor beneath the tubes shall be lined with 2" mineral fiber mono block insulation and 2" ceramic blanket. The boiler furnace/combustion chamber and flueways shall be designed to operate at a positive 0.50" w.c. at the boiler flue outlet. The boiler will require a "positive pressure" type metal flue.

#### **JACKET CONSTRUCTION**

The boiler shall be complete with a metal jacket, 16 gauge, zinc-coated rust resistant steel casing, finished with a suitable heat resisting paint and shall be constructed on a structural steel frame and properly insulated with no less than 1½" fiberglass insulation. Complete jacket and insulation shall be easily removable and reinstalled. The boiler shall incorporate individually removable jacket doors, with handles providing easy access to combustion chamber and access panels. The entire tube area shall be easily accessible for fireside cleaning.

All appropriate controls where possible, shall be mounted on boiler front.

A tube removal and replacement shall be demonstrated at time of start-up. Demonstration time not to exceed 40 minutes.

The boiler vessel shall be warranted for 25 years against thermal shock on a non-pro-rated basis.

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#### **BOILER TRIM AND CONTROL EQUIPMENT**

The following trim and controls shall be furnished:

1. Combination thermometer and pressure gauge
2. Water temperature control operator
3. High limit safety control
4. Low water cutoff
5. ASME safety relief valve(s)

#### **GAS BURNER AND CONTROL EQUIPMENT**

Boiler shall be furnished with a UL listed forced draft flame retention gas burner. Burner shall be complete with integral motor and blower for supplying sufficient combustion air with normal vent conditions.

The following controls shall be furnished:

1. Main manual gas shutoff valves
2. Motorized gas valve operator and auxiliary safety shutoff gas valve (EB75 & EB100)
3. Motorized gas valve with proof of closure operator and auxiliary safety shutoff gas valve (EB125 to EB240)
4. High and low gas pressure switches
5. Gas pilot shutoff and solenoid valves
6. Gas pilot ignition assembly with ignition transformer
7. Pilot and main gas pressure regulators
8. Modulating burner (EB125 to EB240)
9. Adjustable cam gas metering valve (EB125 to EB240)
10. Burner mounted control panel containing:
  - Two indicator lights – power and fuel (EB75 & EB100)
  - Four indicator lights – call for heat, ignition, fuel and flame failure (EB125 to EB240)
  - Air safety switch
  - Fused on/off switch
  - Firing rate potentiometer with manual / auto switch (EB125 to EB240)
  - Motor starter(s) – where applicable
  - Honeywell electronic combustion safety control

#### **OIL BURNER AND CONTROL EQUIPMENT**

Boiler shall be furnished with a UL listed forced draft, pressure atomizing type oil burner, suitable for operation with No. 2 fuel oil. Burner shall be complete with integral motor and blower for supplying sufficient combustion air with normal vent conditions.

The following controls shall be furnished:

1. Oil valves – primary and auxiliary (EB75 & EB100)
2. Two-stage fuel unit burner mounted (EB75 & EB100)
3. Remote mounted oil pump (EB125 to EB240)
4. Direct spark oil ignition assembly (EB75 & EB100)
  - Ignition transformer
  - Oil ignition and nozzle assembly
5. Gas pilot oil ignition assembly (EB125 to EB240)
  - Gas pilot shutoff valve, solenoid valve and gas pilot pressure regulator
  - Gas pilot ignition assembly with ignition transformer
  - Oil nozzle assembly
6. Modulating burner (EB125 to EB240)

7. Adjustable cam oil metering valve (EB125 to EB240)
8. Burner mounted control panel containing:
  - Two indicator lights – power and fuel (EB75 & EB100)
  - Four indicator lights – call for heat, ignition, fuel and flame failure (EB125 to EB240)
  - Air safety switch (EB125 to EB240)
  - Fused on / off switch
  - Firing rate potentiometer with manual / auto switch (EB125 to EB240)
  - Motor starter(s) – where applicable
  - Honeywell electronic combustion safety control

#### **DUAL FUEL GAS/OIL BURNER AND CONTROL EQUIPMENT**

Boiler shall be furnished with a UL listed forced draft, pressure atomizing, dual fuel burner, suitable for operation with No. 2 fuel oil and natural gas (or other gas). Burner shall be complete with integral motor and blower for supplying sufficient combustion air with normal vent conditions.

The following controls shall be furnished:

1. Same equipment as gas burner
2. Same equipment as oil burner
3. Gas pilot ign. assembly for both gas & oil ignitions
4. Manual fuel selection switch

#### **OPTIONAL BOILER TRIM & CONTROLS**

1. Manual reset type high limit
2. Manual reset type low water cutoff
3. Auxiliary low water cutoff(s)
4. Low water cutoff feeder (in addition to, or in place of standard low water cutoff)
5. UL, IRI, CSD-1, FM or other insurance requirements
6. Barometric damper
7. Indirect water heating coils for domestic, pool or process hot water
8. Other controls and boiler trim, as specified

#### **OPTIONAL BURNER CONTROLS AND ACCESSORIES**

1. Two-stage high-low burner with proven LFS (EB75 & EB100)
2. Modulating burner (EB75 & EB100)
3. Auxiliary motorized safety shutoff gas valve
4. Alarm bell(s) or horn(s)
5. Fireeye combustion safety control
6. UL, IRI, CSD-1, FM or other insurance requirements
7. Indicator lights – as specified
8. Direct spark ignition of oil (dual fuel burners)
9. Boiler skid mounted burner control panel
10. Boiler skid mounted burner oil pump set (EB75 & EB100)
11. Adjustable cam gas or oil metering valve(s) (EB75 & EB100)
12. Lead lag systems for two or more boilers
13. Other controls, as specified